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To cite this article: Heather A. Yarger, Kristin Bernard, EB Caron, Allison Wallin & Mary Dozier (2019): Enhancing Parenting Quality for Young Children Adopted Internationally: Results of a Randomized Controlled Trial, *Journal of Clinical Child & Adolescent Psychology*, DOI: 10.1080/15374416.2018.1547972

To link to this article: <https://doi.org/10.1080/15374416.2018.1547972>



Published online: 16 Jan 2019.



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Enhancing Parenting Quality for Young Children Adopted Internationally: Results of a Randomized Controlled Trial

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Children adopted internationally are often dysregulated biologically and behaviorally due to prior experiences of institutional care or caregiving changes and thus are in need of enhanced parental care. The present study assessed whether parents randomized to receive Attachment and Biobehavioral Catch-up (ABC) demonstrated significant improvements in parenting quality when compared to parents receiving a control intervention. Participants were 120 internationally adopted children and their adoptive parents. Sixty-three (52.5%) of the children and 113 (94.2%) of the primary caregivers were female. Children were adopted from several countries and predominantly from China, Russia, South Korea, and Ethiopia. The majority of parents identified themselves as White/non-Hispanic (95.0%). At the start of intervention, parents ranged in age from 26.2 to 51.1 years old ($M = 39.7$, $SD = 6.0$), and children ranged in age from 6.8 months to 48.4 months ($M = 21.9$, $SD = 9.0$). Sensitivity (i.e., contingent responsiveness to a child's cues), intrusiveness (i.e., physical and/or verbal behavior that interferes with a child's autonomy), and positive regard (i.e., positive affect expressed towards a child) were assessed at preintervention, immediately postintervention, and at annual follow-up visits. Parents who received ABC showed better parenting quality at postintervention than parents who received a control intervention, and these effects persisted at a 2-year follow-up. Findings add to the growing evidence that ABC improves parenting abilities, extending findings to adoptive parents and demonstrating that improvements in parenting quality were sustained several years after completion of the intervention. Trial registration: ClinicalTrials.gov NCT00816621.

Early in life, infants depend on stable and sensitive caregiving environments to develop basic regulatory capabilities. Children adopted internationally often experience

institutionalization or frequent changes in caregivers, placing them at risk for negative developmental outcomes. Although international adoption represents a significant intervention itself, given that children move to highly enriched environments, some adopted children continue to show problems with social functioning, such as disorganized attachment and indiscriminate sociability (van den Dries, Juffer, van

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IJzendoorn, & Bakermans-Kranenburg, 2009), and problems with self-regulation, such as inattention/overactivity and physiological dysregulation (Dalen & Theie, 2014). Attachment and Biobehavioral Catch-up (ABC; Dozier & the Infant-Caregiver Project Lab, 2013) is a 10-session intervention designed to enhance parenting quality among caregivers in order to support children's socioemotional and biological development. Specifically, ABC aims to increase sensitivity (i.e., contingent responsiveness to the child's cues), decrease intrusiveness (i.e., verbal and/or physical behaviors that interfere with the child's autonomy), and increase positive regard (i.e., positive affect and/or affection expressed towards the child). ABC has been previously found to enhance parenting quality among high-risk birth parents (Bernard, Simons, & Dozier, 2015; Yarger, Hoye, & Dozier, 2016) and foster parents (Bick & Dozier, 2013). However, questions of whether ABC enhances parenting quality among parents who have adopted children internationally and whether changes in parenting quality are sustained over time have yet to be examined.

Challenges Faced by Adopted Children

Children adopted internationally are typically adopted from either institutional care or foster care. Institutionalization is linked to delays in physical growth, motor development, and cognitive and language functioning (Kreppner et al., 2007; O'Connor et al., 2000). Further, children who experience institutional care show difficulties regulating their attention, behavior, and physiology (Kreppner et al., 2001). Although institutionalization is generally associated with poorer outcomes than foster care (e.g., Welsh & Viana, 2012), children adopted from foster care are also at risk for negative outcomes. Specifically, children who experience either institutional or foster care prior to adoption may show atypical social behaviors, such as indiscriminate sociability, withdrawal, and quasi-autistic behaviors (Chisholm, 1998; O'Connor et al., 2000). Although a number of factors explain variability in these outcomes, such as quality of preadoptive care, timing of adoption, and number of preadoption placements (Grant, Rushton, & Simmonds, 2016; Julian, 2013), it is clear that some children adopted internationally remain at risk for developing problems across domains.

Following adoption into enriched environments, children show rapid catch-up in cognitive and physical development (van IJzendoorn, Bakermans-Kranenburg, & Juffer, 2007; van IJzendoorn & Juffer, 2005), suggesting that adoption itself represents a powerful intervention. However, difficulties in social development and self-regulation may continue following adoption (Juffer & van IJzendoorn, 2005). In particular, adopted children have been shown to be at risk for disorganized attachment, indiscriminate sociability, difficulty regulating

attention, and biological dysregulation (e.g., van den Dries et al., 2009).

One reason for the lasting effects of institutionalization or foster care is the lack of necessary, expected input from a stable primary caregiver early in development. Early in life, children's caregivers serve as coregulators, helping them develop biological regulation (Hofer, 1994). The importance of coregulating caregiving for internationally adopted children is demonstrated by links between the quality of post-adoptive care and social and emotional outcomes. Stams, Juffer, and van IJzendoorn (2002) found that increased maternal responsiveness in infancy was linked to reduced rates of attachment disorganization among children adopted internationally. Further, internationally adopted children with more sensitive mothers show less indiscriminate sociability than internationally adopted children with less sensitive mothers (van den Dries, Juffer, Van IJzendoorn, Bakermans-Kranenburg, & Alink, 2012). Gleason et al. (2014) also found a protective effect of caregiving quality on indiscriminate sociability, although this association was found only among children who had previously demonstrated low attachment disorganization. Finally, early maternal sensitivity has also been found to predict several childhood outcomes among children adopted internationally, including emotion understanding at age 3 (Garvin, Tarullo, Ryzin, & Gunnar, 2012) and social development and cognitive/academic functioning at age 7 (Stams, Juffer, Rispen, & Hoksbergen, 2000). Thus, evidence suggests that sensitive parenting postadoption may promote more optimal functioning among children adopted internationally.

Intervening to Support Healthy Development

Few evidence-based treatments are available to support children's healthy development following international adoption. Juffer and colleagues designed a three-session intervention for mothers of internationally adopted children and found this intervention effective in increasing maternal sensitivity and reducing attachment disorganization among adoptive families in the Netherlands (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005). However, Juffer and colleagues' intervention was tested with a group of children who were adopted at a mean age of 10 weeks, reflecting a sample of children with brief exposure to early deprivation. For children who are adopted at later ages, more intensive treatment may be needed. To fill this gap in services, ABC, an evidence-based intervention developed for children living with birth or foster parents following neglect, was delivered to parents of children adopted internationally. ABC aims to help parents respond in nurturing ways to children's distress and to sensitively follow children's lead with delight in order to support adopted children's development of organized attachment relationships and optimal self-regulation.

A critical first step in evaluating a parenting intervention's effectiveness is examining whether the intervention has the intended effect on changing parenting behavior and whether these changes persist over time. In randomized controlled trials (RCTs) for other populations, the ABC intervention has been shown to improve parenting. Among foster parents, ABC led to improvements in sensitivity relative to a control intervention (Bick & Dozier, 2013). Among biological parents referred by child protective services for neglect, ABC enhanced maternal sensitivity during a play interaction and mothers' brain responses to children's emotional cues (Bernard et al., 2015). Increases in sensitivity and decreases in intrusiveness were also observed in the first five sessions of ABC in a small sample of high-risk mothers (Yarger et al., 2016). In addition to these RCT findings, improvements in parenting were also observed when community-based clinicians implemented ABC with high-risk parents (Caron, Weston-Lee, Haggerty, & Dozier, 2016).

The Present Study

This study assessed, through an RCT, whether parents adopting internationally who received the ABC intervention demonstrated more improvement in parenting quality (i.e., sensitivity, intrusiveness, and positive regard) than parents who received a control intervention. We examined parenting quality up to 5 years postintervention, allowing us to examine not just pre- to postintervention change but also the stability of these changes over time. Examining parenting across longitudinal follow-up is particularly important because prior longitudinal observation of parents of internationally adopted children has shown patterns of both improvement (Croft, O'Connor, Keaveney, Groothues, & Rutter, 2001) and only weak stability ($r = .24$; Stams et al., 2002) in parenting behavior as children grow older. Finally, testing whether ABC improved parenting quality relative to a comparison intervention was a critical first step in examining the efficacy of ABC for parents who adopted internationally.

METHOD

Participants

Participants included 120 children who had been adopted internationally and their parents. Fifty-seven (47.5%) of the children were male. Children's age at adoption ranged from 4.9 months to 37.8 months ($M = 16.3$, $SD = 6.9$). On average, children started the intervention approximately 6 months after entering care. At the initial postintervention visit, children ranged in age from 12.4 months to 77.3 months ($M = 28.0$, $SD = 10.8$). Children were adopted primarily from China ($n = 47$, 39.2%), Russia ($n = 23$, 19.2%), South Korea ($n = 19$, 15.8%), and Ethiopia

($n = 15$, 12.5%). Countries of adoption for the remaining 13.3% of children included Armenia ($n = 1$), Guatemala ($n = 2$), India ($n = 2$), Kazakhstan ($n = 4$), Rwanda ($n = 1$), Thailand ($n = 1$), Ukraine ($n = 1$), Uganda ($n = 1$), Vietnam ($n = 2$), and the Marshall Islands ($n = 1$). Ninety-three children (77.5%) were reported to have been previously institutionalized prior to adoption, with the average length of time institutionalized for these children reported to be 13.1 months ($SD = 6.9$ months) and ranging from 2 to 35 months.

Only primary caregivers were included in the current study. Most primary caregivers were female (94.2%). They ranged in age from 26.2 to 51.1 years old ($M = 39.7$, $SD = 6.0$) at the start of intervention. Most parents were married (91.7%), and the majority were White/non-Hispanic (95.0%). Parents were highly educated (84.2% with college education or higher). The majority of parents (65.8%, $n = 79$) indicated that this was their first time adopting a child. An average of 2.0 children ($SD = 1.0$) including the adopted child were reported living in the home, and 32.5% ($n = 39$) reported having at least one biological child living at home at the time of the preintervention visit. Table 1 presents demographic characteristics of the two intervention groups. Chi-square and independent samples t -tests revealed no significant differences between groups on demographic characteristics, as well as children's time institutionalized.

Procedures

Participant Recruitment

Parents were recruited through adoption agencies in the Mid-Atlantic region. After parents expressed initial interest in the program, research staff contacted families individually to describe participation fully and to obtain consent. All components of this research study were approved by the Institutional Review Board at the University of Delaware. Data collection occurred from April 2009 through May 2017. Figure 1 provides additional information regarding participant enrollment and attrition.

Preintervention and Postintervention Assessments

After consenting, parents were randomly assigned to receive either the ABC (experimental) intervention or the control intervention. Randomization was completed by the project director using a randomly generated number sequence, with parents assigned to intervention group based on whether the next number in the sequence was odd versus even. Parents in both groups completed preintervention visits, followed by 10 intervention sessions, a postintervention visit (approximately four weeks after the intervention), and annual follow-up visits around the time of the child's birthday. Families were provided with

TABLE 1
Child and Parent Demographic Characteristics by Intervention Group

	ABC Intervention ^a	DEF Intervention ^b
<i>Child Characteristics</i>		
Sex, No. (%)		
Male	29 (49.2)	28 (45.9)
Female	30 (50.8)	33 (54.1)
Race/Ethnicity, No. (%)		
White	9 (15.3)	15 (24.6)
African American	6 (10.2)	11 (18.0)
Asian American	40 (67.8)	35 (57.4)
Biracial	3 (5.1)	0 (0.0)
Other	1 (1.7)	0 (0.0)
Age at Intervention, Months		
M (SD)	22.2 (8.5)	22.4 (9.7)
Range	8.0–47.2	9.1–50.5
Age at First Available Postintervention Assessment, Months		
M (SD)	27.1 (8.3)	27.1 (10.1)
Range	12.4–50.7	12.4–54.4
<i>Parent Characteristics</i>		
Sex, No. (%)		
Male	6 (10.2)	1 (1.6)
Female	53 (89.8)	60 (98.4)
Race/Ethnicity, No. (%)		
White	58 (98.3)	56 (91.8)
African American	0 (0.0)	1 (1.6)
Asian American	1 (1.7)	3 (4.9)
Other	0 (0.0)	1 (1.6)
Age at Intervention, Years		
M (SD)	39.9 (6.0)	39.5 (6.1)
Range	28.2–50.8	26.2–51.1
Education Level, No. (%)		
High school	0 (0.0)	2 (3.3)
Some College	9 (15.3)	8 (13.1)
College	22 (37.3)	28 (45.9)
Post College	28 (47.5)	23 (37.7)
Annual Income, No. (%)		
\$40,000–\$59,999	4 (6.8)	4 (6.6)
\$60,000–\$99,999	20 (33.9)	21 (34.4)
\$100,000 or More	35 (59.3)	34 (55.7)
Not Reported	0 (0.0)	2 (3.3)
Marital Status, No. (%)		
Married or Living Together	55 (93.2)	56 (91.8)
Single	4 (6.8)	5 (8.2)

^a*n* = 59.

^b*n* = 61.

\$10 to \$100 per visit for preintervention and follow-up visits as compensation for their time. A total of 388 post-intervention and follow-up assessments of parenting quality were completed. For individual parent-child dyads, the number of postintervention and follow-up assessments ranged from 0 to 5 ($M = 3.2$, $SD = 1.4$). Eight families did not participate in any follow-up visit, and therefore their pre-intervention visit was used at the first follow-up appointment (as consistent with an intent-to-treat analysis). Fifteen

families (12.5%) participated in two follow-up appointments, 27 families (22.5%) participated in three follow-up appointments, 41 families (34.2%) participated in four follow-up appointments, and 21 families (17.5%) participated in five follow-up appointments. A chi-square test revealed no significant differences between intervention groups with regards to the number of families that completed each number of visits. Independent samples *t*-tests and chi-square tests indicated that there were no significant differences between completers (completed all 10 sessions) and noncompleters (completed fewer than 10 sessions) of the intervention on demographic variables including parent and child age at start of intervention, time institutionalized, age at child entering parent's care, and baseline levels of parenting quality. There were significant differences between completers and noncompleters on child gender, such that all children whose parents did not complete intervention were male ($\chi^2 = 5.50$, $p = .03$).

Interventions

Both interventions were manualized, consisted of 10 weekly 60-min sessions, and were delivered in families' homes. Following training in their respective intervention models, clinicians were supervised in weekly group supervision, which included video review. All sessions were video-recorded for the purposes of supervision as well as video-feedback for parents.

Experimental Intervention. The ABC Intervention.

The ABC intervention was designed to help parents be sensitive (i.e., follow the child's lead, express delight, be nonintrusive) in their interactions with their children. Each session focused on a target topic, but these primary targets were then addressed across all remaining sessions after the initial introduction. Sessions 1 and 2 focused on the importance of responding sensitively to children's distress. Session 3 focused on recognizing and responding to signs of disinhibited attachment and represented the only major adaptation to ABC designed to target behaviors of particular concern for internationally adopted children. These early sessions thus introduced the idea that children who experience early adversity may not signal their needs clearly (e.g., failing to show clear attachment signals, or turning to unfamiliar adults). Sessions 4 and 5 focused on enhancing sensitivity by following the child's lead and showing positive regard by delighting in the child. Building on the importance of following the child's lead, Session 6 focused on being nonintrusive and nonfrightening during interactions; in prior RCTs of ABC, this content was covered in two sessions, but in the current study it was reduced to one session to allow the addition of a session focused on disinhibited attachment behaviors. Taken together, Sessions 4–6 highlighted the importance of responding contingently to children's cues to help children

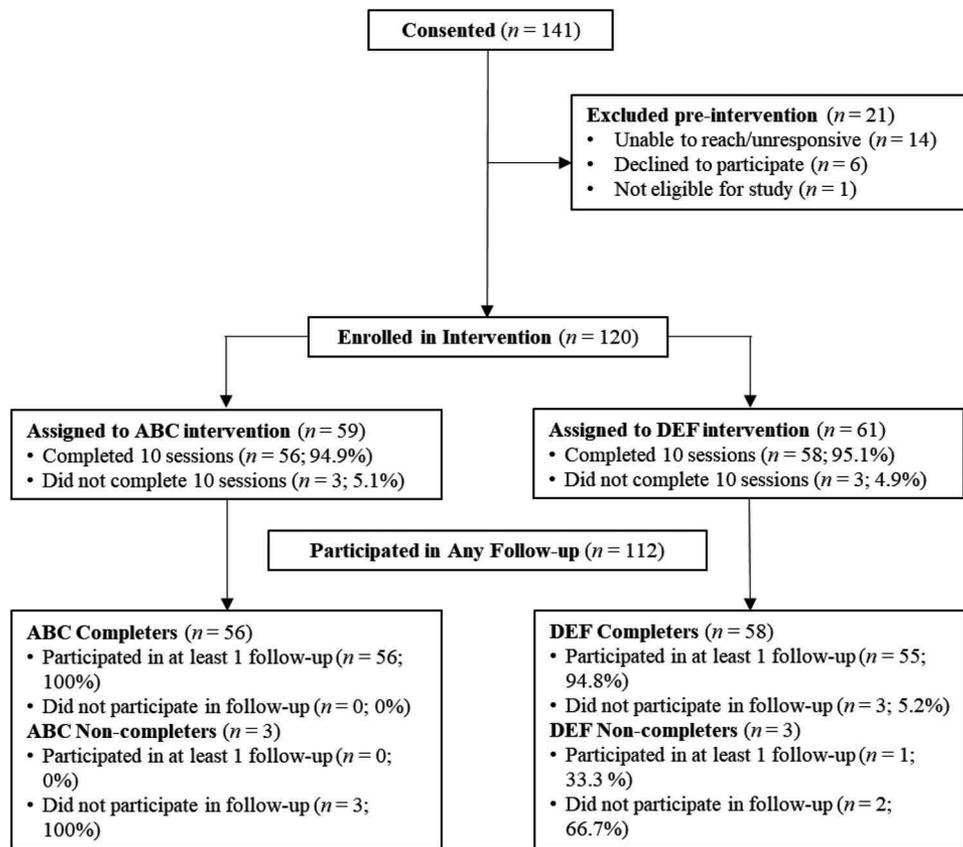


FIGURE 1 CONSORT diagram of parents’ participation in the current study. *Note:* The CONSORT diagram depicts parents identified as primary caregivers only. Each primary caregiver is included once, although multiple children may have been enrolled in the study.

develop optimal regulation. In Sessions 7 and 8, parent coaches reiterated the key targets by helping parents reflect on how their “voices from the past” (i.e., their own attachment experiences that led to automatic thoughts and behaviors while parenting) interfered with sensitive parenting. Finally, in Sessions 9 and 10, parent coaches aimed to consolidate gains through review, feedback, practice, and celebration of change.

Session topics were introduced by presenting a rationale for the target parenting behaviors, including a presentation of research and guided discussion about how such behaviors would support adopted children’s development. The primary method of change, however, was providing “in-the-moment” feedback to parents about their behavior and interactions during the sessions. For example, in the midst of a discussion about how following the lead supports children’s regulation of their attention, the parent coach was expected to comment on observed behaviors that were consistent with intervention targets. For example, the parent coach might comment, “That’s a wonderful example of following her lead. She handed the block to you and you took it from her. When you respond to those cues by following her lead, it helps her develop the ability

to regulate her attention and behavior.” By commenting on these behaviors as they occur, parent coaches make it very clear what behaviors are in line with intervention targets and why they are important. Further, these comments serve to highlight parents’ strengths and celebrate progress. Parent coaches also use in-the-moment commenting to shape or gently challenge interactions that are inconsistent with targets (e.g., responding in insensitive or intrusive ways). In addition to in-the-moment comments, parent coaches use video feedback (i.e., brief video clips from sessions) to highlight parents’ strengths, challenge weaknesses, and celebrate changes in behaviors.

Control Intervention. *Developmental Education for Families (DEF).* The DEF intervention was adapted from a home-visiting program that was previously found to be effective in enhancing intellectual functioning (Ramey, McGinness, Cross, Collier, & Barrie-Blackley, 1982). During sessions, the parent coaches provided parents with activities developed to improve children’s fine and gross motor abilities (e.g., putting shapes in a shape container, building towers), strength and endurance (e.g., crawling up and down steps), balance (e.g., walking on various textured

materials), hand–eye coordination (e.g., pushing a shopping cart while putting toys into it), language abilities (e.g., labeling objects used in play), and cognitive abilities (e.g., engaging in symbolic play with toys). The intervention was modified to meet each child’s individual developmental level and needs, and no broad adaptations were made for the internationally adopted population. Components that targeted maternal sensitivity were removed to keep the interventions distinct.

Measures

Demographics

At preintervention visits, parents completed a questionnaire about the child’s adoption history, including date of adoption and country of origin, as well as demographic information for themselves and their adopted child.

Parenting Quality

Parenting behaviors were coded from video-recorded play assessments in which parents were instructed to interact with their child as they normally would. Play assessment procedures varied slightly depending on the child’s age. For children younger than 18 months, parents played with their children for 9 min. Children were placed in a high chair and given a set of three toys (i.e., squeaky toy, rattle, stacking cups); parents were instructed to interact first at a distance of approximately three ft (without touching the toys) and then at whatever distance they liked (allowed to touch the toys). For children between 18 and 35 months, parents played with their children for 5–7 min with a set of blocks. For children 36–59 months, parents played with their children for 7 min with Play-Doh and related toys (e.g., cookie cutters, rollers, etc.). At 60+ month assessments, parents played with children with either Play-Doh or an art kit (i.e., construction paper, markers, stencils, stickers), depending on the time of administration (90% of the sample played with the art kit). After the block and Play-Doh assessments were completed, a 3-min cleanup was filmed; however, coders were instructed to code primarily based on the free play interaction.

Video-recorded play interactions were coded using three 5-point scales (i.e., Sensitivity, Intrusiveness, Positive Regard) adapted from the Observational Record of the Caregiving Environment (NICHD Early Child Care Research Network, 1996; Owen, 1992). The Sensitivity scale assessed the parent’s ability to follow the child’s lead by responding appropriately to the child’s signals during nondistress interactions. At high levels of sensitivity, parents responded contingently to children’s cues, adjusting their behavior to the interests and pace of the child. At low levels of sensitivity, parents failed to respond appropriately

to children’s bids, perhaps appearing detached or disengaged or taking the lead in the interaction. The Intrusiveness scale assessed the parent’s engagement in psychologically or physically directive behaviors. At high levels of intrusiveness, parents may have invaded the child’s physical space, forcefully introduced toys to the child (ignoring cues of disinterest), or repeatedly questioned or corrected the child. At low levels of intrusiveness, parents did not engage in these potentially dysregulating behaviors. The Positive Regard scale assessed the parent’s expressions of positive affect and delight directed toward the child during the interaction. At high levels of positive regard, parents demonstrated genuine enjoyment in the child through smiling, laughing, clapping, or speaking in a warm or excited tone of voice. At low levels of positive regard, parents appeared disinterested, flat, or unhappy during the interaction.

Coders were trained to reliability by achieving at least a .75 correlation on each scale with a master coder on a reliability set of 10 videos. Coders were unaware of intervention condition and coded only one time point per parent to maintain independence of ratings. All videos were double-coded, and average scores were used in the analyses. One-way, average measures intraclass correlations for Sensitivity, Intrusiveness, and Positive Regard were .71, .67, and .73, respectively. Means, standard deviations, and the number of participants with data available at each time point are presented in Table 2. Given that the age of the child at study enrollment varied and data collection for follow-up appointments occurred yearly on the child’s subsequent birthdays, the number of possible time points for each family varied, as did timing in relation to postintervention.

Data Analytic Strategy

For primary analyses, we examined whether ABC and the control group differed in pre-to-post change in parenting behavior and to what extent intervention-related changes in parenting behavior were sustained over time. We used piecewise hierarchical linear growth modeling (Raudenbush & Bryk, 2002), which accounted for the nonindependence of repeated measures of parenting behavior. Hierarchical linear growth modeling was ideal for analyzing change in parenting over time because it allowed for variability in the number and spacing of data points. Full maximum likelihood estimation was used to account for missing data. An intent-to-treat analysis was used, such that all participants enrolled at the time of the study were included in analyses. Separate linear growth models were estimated for each of the three parenting behaviors.

The first linear component (Piece 1) captured change between preintervention parenting quality and the first follow-up visit after completion of the intervention. The second linear component (Piece 2) captured change

TABLE 2
Means and Standard Deviations Across Time by Intervention Group

Time point	ABC				DEF			
	n	Sensitivity	Intrusiveness	Positive Regard	n	Sensitivity	Intrusiveness	Positive Regard
		M (SD)	M (SD)	M (SD)		M (SD)	M (SD)	M (SD)
Pre-int	58	3.22 (.86)	2.11 (1.03)	3.97 (.79)	61	3.03 (.89)	2.03 (.91)	3.95 (.89)
0–6.99	66	3.58 (.83)	1.89 (.96)	4.33 (.65)	62	3.02 (.91)	2.30 (.99)	3.91 (.86)
7–12.99	26	3.81 (.86)	1.63 (.67)	4.17 (.72)	23	3.28 (1.01)	2.11 (.94)	4.11 (.77)
13–18.99	21	3.81 (.75)	1.74 (.93)	4.10 (.61)	13	3.30 (.88)	1.62 (.65)	3.15 (.77)
19–24.99	27	3.74 (.92)	1.56 (.61)	3.63 (.92)	25	3.50 (.87)	1.76 (.69)	3.86 (.97)
25–30.99	19	3.76 (.81)	1.61 (.70)	3.84 (.83)	13	3.50 (.58)	1.42 (.53)	3.46 (.66)
31–36.99	14	3.71 (.61)	1.46 (.46)	3.34 (1.02)	22	3.30 (.85)	1.48 (.52)	3.34 (1.02)

Note: In some cases, parents completed multiple visits during each time-bin. Data analyses in hierarchical linear growth modeling accounted for duplicate assessments of each parents’ parenting quality. ABC = Attachment and Biobehavioral Catch-up; DEF = Developmental Education for Families; Pre-int = preintervention.

in parenting quality across all follow-up visits after completion of the intervention.

Child age at each assessment was included as a Level 1 time-varying covariate, and grand-centered (i.e., centered on the overall average age of children at each time point). We present the model for sensitivity as an example. The Level 1 model was as follows:

$$\text{Sensitivity}_{ti} = \pi_{0i} + \pi_{1i}(\text{Child age}_{ti}) + \pi_{2i}(\text{Piece 1}_{ti}) + \pi_{3i}(\text{Piece 2}_{ti}) + e_{ti}$$

with π_{0i} representing parent i ’s sensitivity when time was 0, π_{1i} representing the effect of the time-varying covariate (i.e., child age) on parent i ’s sensitivity at time t , π_{2i} representing the rate of linear change in sensitivity from preintervention to postintervention for parent i , π_{3i} representing the rate of linear change in sensitivity from post-intervention through the follow-up visits for parent i , and e_{ti} representing the within-individual error in parent i ’s sensitivity.

Time was coded with respect to the intervention, with each unit of time representing a 6-month interval, following approaches used in other studies (e.g., Xiong & Dubin, 2010).

The following Level 2 model was specified to examine whether participating in the ABC intervention enhanced parenting compared to the control intervention. At Level 2, the model included intervention type as a between-subject predictor (Intervention: DEF = 0, ABC = 1). The resulting Level 2 model was as follows:

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01}(\text{Intervention}_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(\text{Intervention}_i) + r_{1i}$$

$$\pi_{2i} = \beta_{20} + \beta_{21}(\text{Intervention}_i) + r_{2i}$$

$$\pi_{3i} = \beta_{30} + \beta_{31}(\text{Intervention}_i) + r_{3i}$$

with β_{00} representing the mean sensitivity level for parents when other predictors equal zero (i.e., the mean sensitivity for DEF parents at postintervention); β_{01} representing the effect of ABC participation on the mean sensitivity level for parents at postintervention (when time is 0); β_{10} and β_{11} representing the mean effects of child age on parent sensitivity for DEF and ABC parents, respectively (i.e., mean change in sensitivity for every 1-unit increase in age), at time 0; β_{20} representing the mean rate of change in sensitivity from pre- to postintervention (Piece 1) time for DEF parents; β_{21} representing the effect of ABC on the rate of change in sensitivity from pre- to postintervention; β_{30} representing the mean rate of change in sensitivity from postintervention through follow-up visits for DEF parents; and β_{31} representing the effect of ABC on the rate of change in sensitivity from postintervention through follow-up visits. To examine whether intervention-related differences in parenting behavior remained significant at each follow-up time point, we recentered the model’s intercept by recoding the time variables.

RESULTS

Preliminary Analyses

Intercorrelations among sensitivity, intrusiveness, and positive regard at preintervention were as follows: sensitivity and intrusiveness ($r = -.52, p < .01$), sensitivity and positive regard ($r = .42, p < .01$), and intrusiveness and positive regard ($r = -.03, ns$). Bivariate correlations revealed no significant associations between children’s demographic characteristics (i.e., time institutionalized, gender), parental age at start of intervention, and baseline levels of parenting quality. However, children’s age at the time of adoption or entering

care was significantly associated with preintervention levels of parents' sensitivity ($r = .22, p < .05$) and intrusiveness ($r = -.32, p < .01$). Upon further investigation, children's age at the preintervention visit was significantly associated with baseline levels of parents' sensitivity and intrusiveness, and was therefore included as a Level 1 time-varying covariate.

Two-Piece Model of Change in Parenting Quality

Baseline Levels of Parenting Quality

Intervention groups did not differ in sensitivity, intrusiveness, or positive regard at the preintervention time point ($p > .05$).

Sensitivity

Parents who participated in ABC were significantly more sensitive than parents who participated in DEF at the first postintervention visit. Furthermore, parents in ABC showed a steeper rate of change in sensitivity than parents in DEF from pre- to postintervention. More specifically, DEF parents showed an average decrease of 0.03 units in sensitivity (β_{20}) from pre- to postintervention, whereas ABC parents showed an average increase of 0.34 units in sensitivity ($\beta_{20} + \beta_{21}$) from pre- to postintervention. See Table 3 for results. ABC parents remained significantly higher on sensitivity than DEF parents at each time point, through 25–30 months postintervention (see Figure 2). The magnitude of the change in sensitivity from preintervention to the first postintervention visit reflected a small-to-medium effect size ($d = 0.42$), 95% confidence interval $[-0.02, 0.87]$.

Intrusiveness

Parents in ABC showed a steeper decline in intrusiveness than parents in DEF from pre- to postintervention. More specifically, DEF parents showed an average increase of 0.41 units (β_{20}) from pre- to postintervention, whereas ABC parents showed an average decrease of 0.15 units ($\beta_{20} + \beta_{21}$), from pre- to postintervention. See Table 4 for results. During the follow-up period, DEF parents showed increasing intrusiveness over time ($\beta_{30} = .10, p < .05$). By 7 to 12 months postintervention, parents who participated in ABC were significantly less intrusive than parents who participated in DEF. Specifically, DEF parents showed mean levels of intrusiveness of 1.87 (β_{00}), whereas ABC parents showed mean levels of intrusiveness of 1.59 ($\beta_{00} + \beta_{01}$). ABC parents remained significantly lower on intrusiveness than DEF parents through the 31–36 months postintervention time point (see Figure 3). The magnitude of the change in intrusiveness from preintervention to the first postintervention visit reflected a medium effect size ($d = -0.50$), 95% CI $[-0.84, -0.17]$.

Positive Regard

Finally, parents who participated in ABC showed significantly more positive regard than parents who participated in DEF at the first follow-up session. Furthermore, ABC parents showed a steeper rate of change in positive regard than DEF parents from pre- to postintervention ($p < .05$). More specifically, on average, DEF parents showed approximately no change (0.05) in positive regard, β_{20} , from pre- to postintervention, whereas ABC parents showed an average increase of 0.44 units in

TABLE 3

Parameter Estimates for Piecewise Linear Growth Model of Sensitivity as a Function of Intervention Group Centered at First Postintervention Visit

Fixed Effects	Coefficient	SE	t-Ratio	p
Intercept, mean level of sensitivity at postintervention for DEF, β_{00}	3.38	.12	27.9	< .001
ABC effect on intercept, β_{01}	.49	.17	2.88	.005
Child age slope effect, mean effect of child age on sensitivity at postintervention for DEF, β_{10}	.02	.01	3.25	.001
ABC effect on child age slope, β_{11}	-.01	.01	-4.83	.630
Piece 1 slope, mean rate of change in sensitivity from pre- to postintervention for DEF, β_{20}	-.03	.13	-.27	.787
ABC effect on Piece 1 slope, β_{21}	.37	.18	2.07	.041
Piece 2 slope, mean rate of change in sensitivity from postintervention to follow-up visits, β_{30}	-.09	.05	-1.83	.070
ABC effect on Piece 2 slope, β_{31}	-.01	.07	-.18	.859
Level 2 Random Effects	SD	Variance	<i>p</i>	
Intercept variance, r_{0i}	.34	.29	.240	
Child age slope variance, r_{1i}	.01	.00	.468	
Piece 1 slope variance, r_{2i}	.32	.10	.393	
Piece 2 slope variance, r_{3i}	.06	.00	.431	

Note: DEF = Developmental Education for Families; ABC = Attachment and Biobehavioral Catch-up.

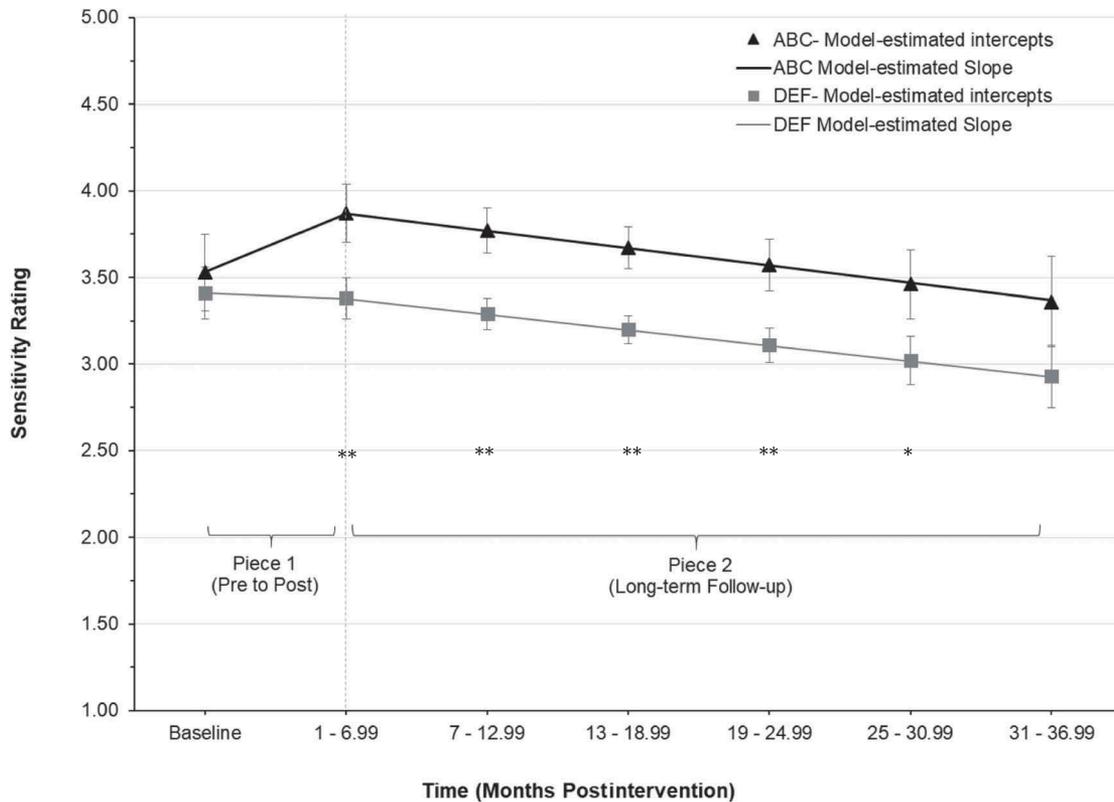


FIGURE 2 Change in sensitivity from preintervention to 36 months postintervention. *Note:* Results demonstrate when child age is centered on the grand-mean. * $p < .05$. ** $p < .01$.

TABLE 4

Parameter Estimates for Piecewise Linear Growth Model of Intrusiveness as a Function of Intervention Group Centered at First Postintervention Visit

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>SE</i>	<i>t-Ratio</i>	<i>p</i>
Intercept, mean level of intrusiveness at postintervention for DEF, β_{00}	1.77	.10	16.97	< .001
ABC effect on intercept, β_{01}	-.23	.14	-1.63	.106
Child age slope effect, mean rate of change in intrusiveness at postintervention for DEF, β_{10}	-.04	.01	-5.30	< .001
ABC effect on child age slope, β_{11}	.02	.01	1.47	.144
Piece 1 slope, mean rate of change in intrusiveness from pre- to postintervention for DEF, β_{20}	.41	.11	3.60	< .001
ABC effect on Piece 1 slope, β_{21}	-.56	.16	-3.53	< .001
Piece 2 slope, mean rate of change in intrusiveness from postintervention to follow-up visits, β_{30}	.10	.04	2.33	.022
ABC effect on Piece 2 slope, β_{31}	-.04	.06	-.70	.485
Level 2 Random Effects	<i>SD</i>	<i>Variance</i>	<i>p-Value</i>	
Intercept variance, r_{0i}	.34	.11	.370	
Child age slope variance, r_{1i}	.03	.00	.232	
Piece 1 slope variance, r_{2i}	.14	.02	.028	
Piece 2 slope variance, r_{3i}	.12	.02	.330	

Note: DEF = Developmental Education for Families; ABC = Attachment and Biobehavioral Catch-up.

positive regard ($\beta_{20} + \beta_{21}$) from pre- to postintervention. See Table 5 for results. Parents who participated in ABC showed a significantly higher level of positive regard than parents who participated in DEF through 19 to

24 months postintervention (see Figure 4). The magnitude of the change in positive regard from preintervention to the first postintervention visit reflected a medium effect size ($d = 0.50$), 95% CI [0.28, 0.72].

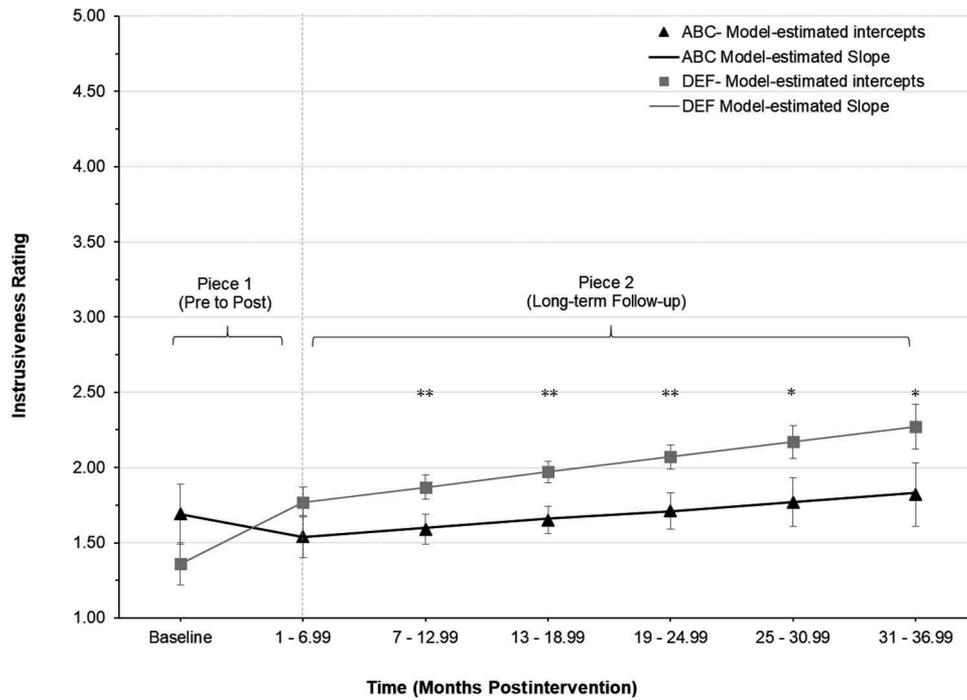


FIGURE 3 Change in intrusiveness from preintervention to 36 months postintervention. *Note:* Results demonstrate when child age is centered on the grand-mean. * $p < .05$. ** $p < .01$.

TABLE 5
Parameter Estimates for Piecewise Linear Growth Model of Positive Regard as a Function of Intervention Group Centered at First Postintervention Visit

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>SE</i>	<i>t-Ratio</i>	<i>p</i>
Intercept, mean level of positive regard at postintervention for DEF, β_{00}	3.85	.13	29.02	< .001
ABC effect on intercept, β_{01}	.37	.19	1.99	.049
Child age slope effect, mean effect of child age on positive regard at postintervention for DEF, β_{10}	-.01	.01	-1.04	.299
ABC effect on child age slope, β_{11}	.00	.01	-.25	.727
Piece 1 slope, mean rate of change in positive regard from pre- to postintervention for DEF, β_{20}	.05	.12	.46	.648
ABC effect on Piece 1 slope, β_{21}	.39	.16	2.36	.020
Piece 2 slope, mean rate of change in positive regard from postintervention to follow-up visits, β_{30}	-.05	.06	-.88	.381
ABC effect on Piece 2 slope, β_{31}	-.02	.08	-.29	.769
<i>Level 2 Random Effects</i>	<i>SD</i>	<i>Variance</i>	<i>p</i>	
Intercept variance r_{0i}	.59	.35	.049	
Child age slope variance r_{1i}	.02	.00	> .500	
Piece 1 slope variance r_{2i}	.32	.11	.456	
Piece 2 slope variance r_{3i}	.11	.01	> .500	

Note: DEF = Developmental Education for Families; ABC = Attachment and Biobehavioral Catch-up.

DISCUSSION

We found that ABC increased sensitivity and positive regard, and decreased intrusiveness, among parents of internationally adopted children. Significant differences between ABC and the control condition persisted until at least 2.0 years postintervention for sensitivity, 2.5 years postintervention for intrusiveness, and 1.5 years

postintervention for positive regard, when controlling for child’s age at each assessment. These results add to the growing evidence that ABC promotes sensitive parenting and provides evidence of sustained changes in parenting over time.

This longitudinal work is unique in the population it addressed, yet it is not without precedent. A review of long-term outcomes of parenting-focused preventative

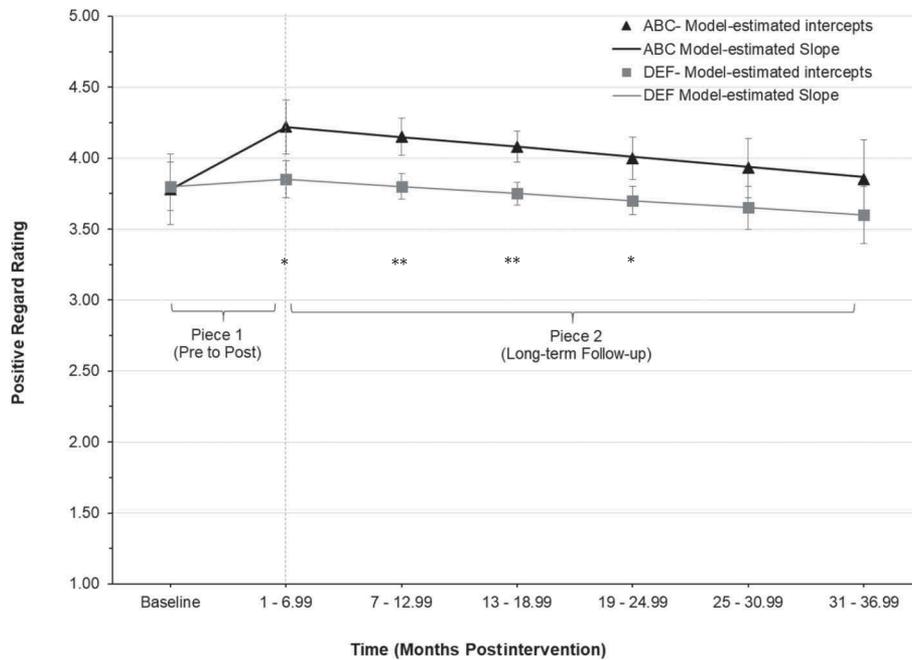


FIGURE 4 Change in positive regard from preintervention to 36 months postintervention. *Note:* Results demonstrate when child age is centered on the grand-mean. * $p < .05$. ** $p < .01$.

interventions found that 10 of 22 programs were found to have effects on parenting that lasted 3 years or more after the end of intervention (Sandler, Ingram, Wolchik, Tein, & Winslow, 2015). Our findings demonstrate that ABC's effects on parenting are sustained over time among a high-functioning sample of adoptive parents. Unlike the child protective services-involved parents with whom ABC had been previously shown to improve parenting (Bernard et al., 2015), most parents in the current study were highly educated, were married, and had high income. Further, the parents in the current study exhibited relatively high levels of sensitivity at baseline. That ABC resulted in sustained changes in parenting in such a high-functioning sample speaks to the application of ABC to diverse samples of parents.

Although sustained changes in dimensions of parenting quality were seen over time, by the later time points, levels of sensitivity and positive regard of ABC parents and DEF parents began to converge. The nonsignificant differences in sensitivity and positive regard at later assessment points may have reflected true erosion of intervention effects on parenting behavior over time; perhaps parents struggled to adapt the parenting skills as children aged or to maintain the skills without ongoing external support. Alternatively, the reduced sample size (and reduced power) at later time points may have contributed to nonsignificant effects. Nevertheless, our findings suggest that ABC effectively engaged the purported mechanism of change (i.e., parental sensitivity) during a critical developmental time period. Maternal sensitivity within the first 3 years of children's

lives has been shown to predict children's social and academic competence from early childhood through adulthood (Raby, Roisman, Fraley, & Simpson, 2015). Thus, given our findings of enhanced parenting during this critical developmental period, an important next step is to examine whether enhanced parental sensitivity serves as the mechanism of intervention effects on child outcomes. Although outside of the scope of the current article, evidence for the impact ABC has on child-level outcomes is forthcoming (e.g., Lind, Raby, Goldstein, Bernard, & Dozier, under review; Raby, Dozier, & Carlson, In prep). Examining the extent to which enhanced parenting quality during the first few years of life, even if not sustained into school-age years, is enough to promote optimal development will be important in determining whether booster sessions or later intervention are necessary.

We also found that children's age was associated with parenting quality, such that parents of younger children showed less sensitive and more intrusive behavior. At younger ages, children are less mobile, less verbal, and less likely to play with toys in "correct" ways. As such, the play behaviors young babies demonstrate may be more difficult to respond to sensitively, and consistent with some prior literature (e.g., Cerezo, Pons-Salvador, & Trenado, 2008), parents in the current study appeared more likely to engage in directive behavior with them.

Strengths of the study include randomization to intervention condition, and repeated assessments of parenting over time. On average, we had 4.2 data points per parent,

allowing us to use hierarchical linear modeling to examine trends and increasing confidence in the results. Finally, the use of an intent-to-treat analysis, as well as full maximum likelihood to keep all possible data points increase the confidence of these results.

Several limitations are also notable and provide areas for future research. The current study assessed the parenting quality of only one parent, who was usually female, limiting our ability to generalize the intervention's effect on other caregivers in the home, as well as to ask specific questions about fathers' parenting quality in the home. Future studies should work to include fathers in research. Further, given the heterogeneity of children's preadoption history, questions remain with regards to whether all children adopted internationally would benefit from interventions aimed at improving an already sensitive group of parents. Therefore, studies should continue to parse apart the impact of adoption itself versus the effect of interventions aimed at improving parenting quality for children adopted internationally. Relatedly, child and parent characteristics should continue to be investigated to identify clear indicators for children that may benefit most from interventions such as ABC after adoption. Importantly, our study focused on sensitivity to nondistress; future studies should investigate parents' responsiveness to distress and its subsequent impact on child functioning, as well as the bidirectional effects of child behavior and parenting behavior on children's development. Finally, the effect sizes observed in the current study from preintervention to postintervention are smaller than effect sizes in previous studies of the impact of ABC on parental sensitivity ($d = .89, .70$) and intrusiveness ($-1.21, -.81$; Caron et al., 2016; Yarger et al., 2016). This difference may be due to the higher baseline levels of sensitivity and positive regard and lower baseline levels of intrusiveness observed in this sample of parents when compared to those prior samples (less than 3 on sensitivity, greater than 3 on intrusiveness). In contrast, the effect size of the impact of ABC on positive regard in the current study ($d = .50$) is similar to those previously documented ($d = .41$; Caron et al., 2016). The absolute and relative magnitude of change in parenting behavior needed to impact children's development is unknown and again points to the need to further investigate additional parent and child factors that may place some children at continued risk for negative developmental outcomes after adoption and what levels of sensitive parenting are important for each child.

In summary, we found that the ABC intervention increased sensitivity and positive regard and decreased intrusiveness among internationally adopting parents, with changes sustained between 1.5 to 2.5 years postintervention. Although the process of being adopted has demonstrated lasting benefits on children's social-emotional functioning, some children remain at risk for

difficulties. For children at risk, interventions such as ABC may provide additional support for children's continued positive development. Specifically, ABC may be helpful for families with children who have preadoptive histories that lack consistent primary caregivers, or who are showing early social or emotional difficulties (e.g., indiscriminate sociability, dysregulated behavior). Although future work is needed to demonstrate ABC's benefits for children, findings provide a promising first step for a population for whom evidence-based interventions are scarce.

ACKNOWLEDGMENTS

We thank the children and families who participated in the research. We also acknowledge the help of occupational and physical therapists at The Children's Hospital of Philadelphia, who helped to adapt the control intervention to address the specific needs of internationally adopted children.

FUNDING

The project described was supported by National Institutes of Mental Health grant R01MH052135, R01MH074374, and R01MH084135 to the fifth author (MD). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Mental Health.

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